Alberta's Supply Model: Education and Skills, 2005-2015

Alberta
Human Resources and Employment

106-06906/

Highlights

- The proportion of Albertans with a post-secondary education is expected to increase from 47.3% to 53.4% over the forecast period of 2005 to 2015.
- More females than males, 56.1% compared to 50.6%, are expected to have obtained a post-secondary education by 2015.
- There will be more people who have graduated from the fields of education, humanities, social sciences, and engineering at the university level than from college and trade institutions.
- It is expected that there will be more Albertans with fine arts, commerce, and applied science technologies and trades qualifications at the college and trade level than the university level.
- At the college and trade level a higher percentage of males than of females will have qualifications in the applied science technologies and trades field, 66.7% compared to 9.0%. Females are expected to have higher percentages with commerce, management, and business administration and health qualifications.
- Of those Albertans with university degrees, females are more likely than males to have studied in education and health fields. Meanwhile, males are more likely to have commerce, engineering, and mathematical and computer science qualifications.
- Ways of attracting people of the non-traditional gender into trades and health fields of study should be looked at to help ease potential labour shortages.

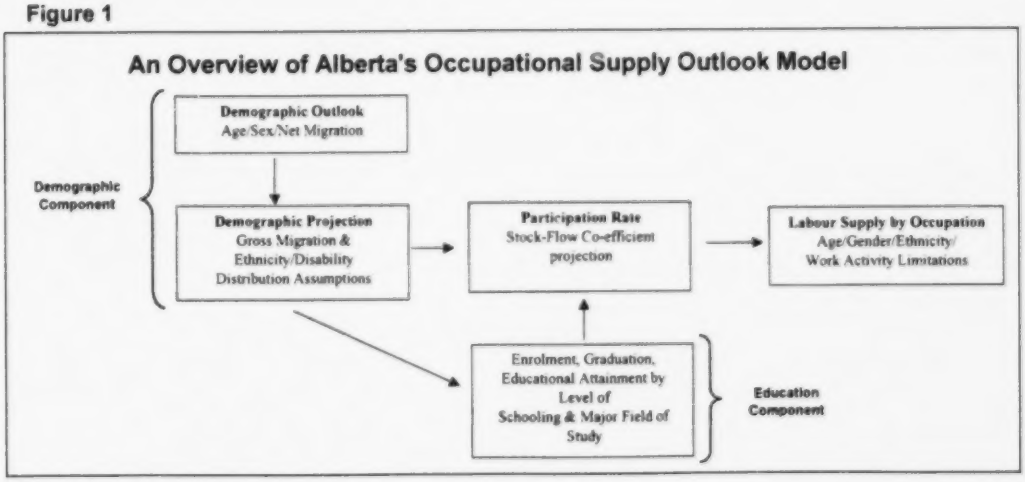
Introduction

Each year Alberta Human Resources and Employment (AHRE) produces Alberta's Occupational Supply Outlook Model (AOSOM)[1]. The AOSOM provides labour supply forecasts for 140 occupational groups covering a ten-year forecast period. The model contains 30 linked sub-models and over 100,000 data series.

The education sub-model is a critical component of the AOSOM. The model forecasts the number of enrolments and graduates across eleven major fields of study, which are listed in Appendix A, for different levels of schooling. These forecasts can then be translated into the occupations where these people are expected to look for employment. Figure 1 provides an overview of the AOSOM and the role of the education component in forecasting labour supply.

The first section of the report looks at the projected educational attainment levels of Alberta's population. The remainder of the report gives an analysis of the major fields of study at different post-secondary education levels and by gender. Following the text, Appendix B details the assumptions underlying the education forecasts and Appendix C shows the results of the model projections.

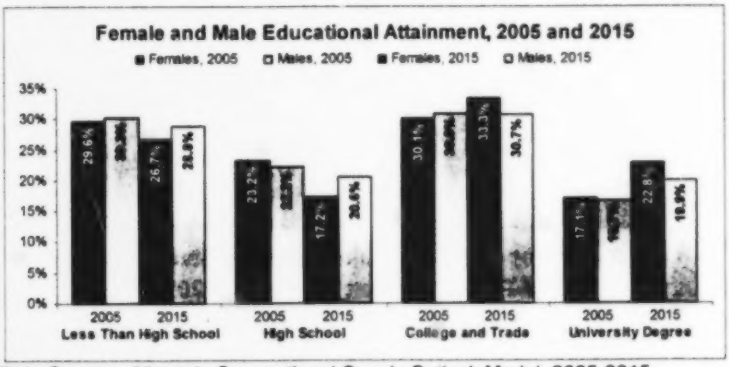
Figure 1



[1] See http://www3.gov.ab.ca/hre/lmi/lmjobs.asp for more reports on Alberta's Occupational Supply Outlook

Over the forecast period of 2005 to 2015, the proportion of people with a post-secondary education is expected to increase from 47.3% to 53.4%. Meanwhile, the other categories, less than high school and high school, are expected to decrease. Chart 1 compares the proportion of each gender projected to have attained each level of education in 2005 and 2015. It is expected that females will have larger proportions with post-secondary education in 2015 than males, 56.1% compared to 50.6%.

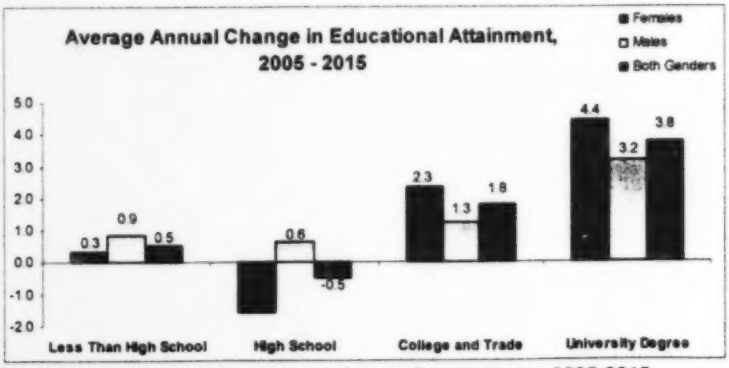
Chart 1



Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

Chart 2 shows the average annual change in educational attainment between 2005 and 2015 for males, females, and for both genders. While the university degree attainment level shows the highest average annual change with 3.8%, high school has the lowest at –0.5% per year. Females are expected to have higher growth rates than males for post-secondary levels of attainment, and lower for high school and less than high school attainment levels. These changes are the result of an increase in post-secondary enrolment rates over the forecast period, particularly for females.

Chart 2



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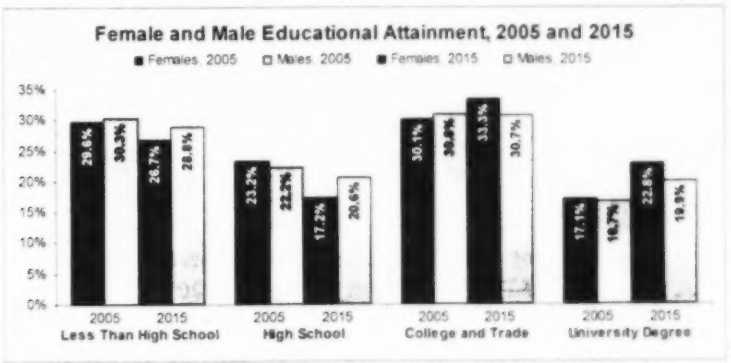

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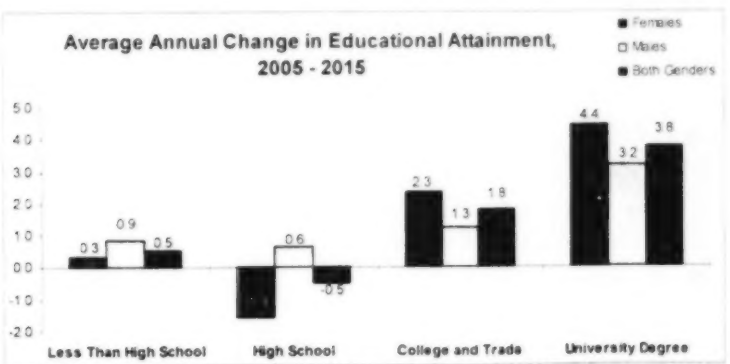
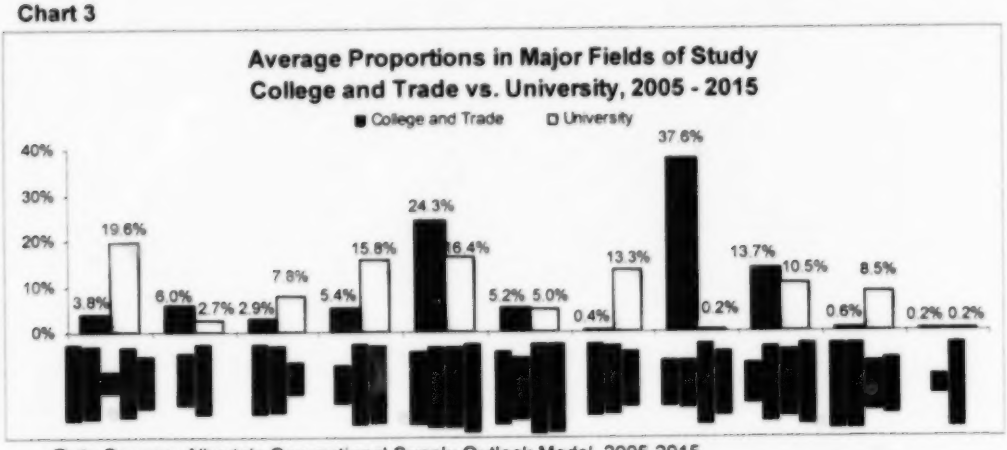


Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

Chart 3 compares the average proportions in each major field of study between college and trade and university levels of educational attainment. There are certain major fields of study that have different representations at the college and trade level than at the university level. There are higher proportions with education, humanities, social sciences, engineering, and mathematical and computer sciences qualifications from universities than from college and trade institutions. On the other hand, there are larger proportions with fine arts, commerce, and applied science technologies and trades qualifications at the college and trade level than at the university level. The only major fields of study where the proportions are similar between college and trade and university are agricultural, biological, nutritional, and food sciences and health professions.

Chart 3

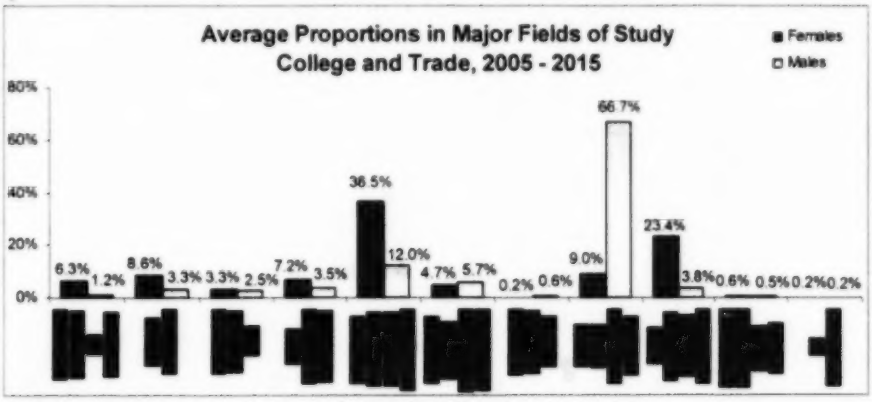


Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

These differences are likely due to the differences in degree and diploma programs offered by college and trade institutions compared with universities. These differences remain similar over the forecast period of 2005 to 2015, as there are no significant changes in the proportions at either educational attainment level over the period.

Chart 4 compares the average proportions over the forecast period 2005 to 2015 of all college and trade graduates in each major field of study by gender. There are higher proportions of females than males with qualifications in most major fields of study, except for applied science technologies and trades, with 66.7% of males compared to 9.0% of females. Females have larger proportions with commerce, management, and business administration and health qualifications.

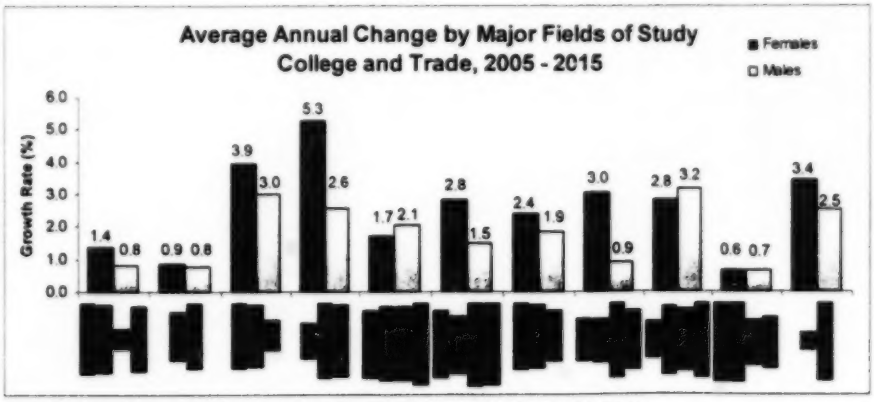
Chart 4



Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

According to Chart 5, females have higher average annual growth rates than males for nearly all the major fields of study over the forecast period of 2005 to 2015. The only exceptions are in commerce, health, and mathematical and computer sciences. The differences between genders are the greatest for social sciences and applied science technologies and trades. This is because the enrolment rates for females are expected to increase at a faster rate than for males over the forecast period.

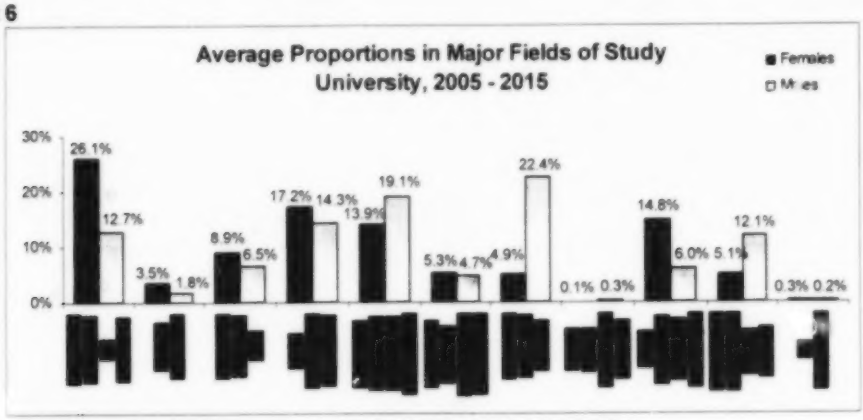
Chart 5



Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

Chart 6 shows the average proportions over the forecast period of 2005 to 2015 of all university graduates in each major field of study by gender. A higher proportion of females than males are expected to have qualifications in education and health fields of study. Males have higher proportions with commerce, engineering, and mathematical and computer science qualifications. These are the fields that have traditionally been dominated by one gender or the other.

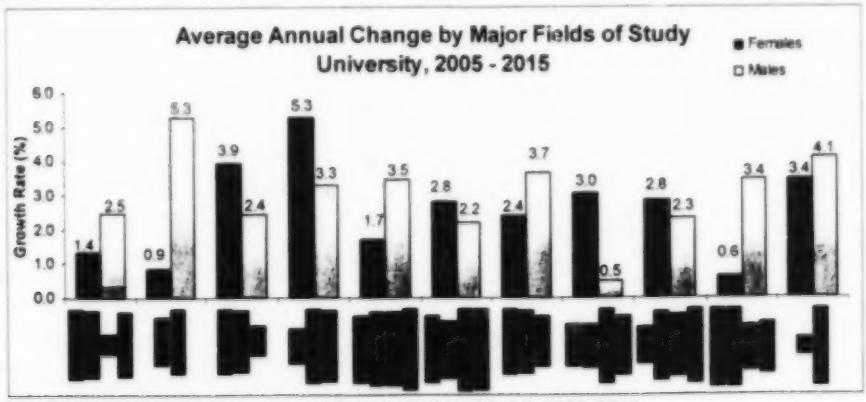
Chart 6



Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

Chart 7 shows the average annual growth rates for males and females in each major field of study over the forecast period 2005 to 2015. Males are anticipated to have much higher growth rates than females in fine arts, commerce, engineering, and mathematical and computer sciences. Females will have higher growth rates in humanities, social sciences, and applied science technologies and trades. For the education field of study, both genders are expected to have relatively low growth rates.

Chart 7



Data Source: Alberta's Occupational Supply Outlook Model, 2005-2015

Summary and Conclusion

Over the coming decade, 2005 to 2015, the overall level of educational attainment in Alberta is expected to increase as more people enroll in post-secondary institutions. It is anticipated that the enrolment rates for females will increase more over the forecast period than for males, resulting in a higher proportion of females having obtained a post-secondary education.

There are many differences between what types of diplomas and degrees post-secondary graduates are receiving according to what type of institution they have attended. Males have a higher proportion than females with qualifications in applied science technologies and trades at both educational attainment levels, however, females are expected to have high average annual growth rates in this field over the forecast period. On the other hand, females have higher proportions with qualifications in health from both types of institutions.

According to Alberta's Occupational Demand and Supply Outlook, 2005-2015[2] occupations related to the trades and health major fields of study are expected to be in need of labour over the coming decade. Therefore, ways of attracting people of the non-traditional gender into these fields of study could be looked at to help ease potential labour shortages.

[2] Available at http://www3.gov.ab.ca/hre/lmi/lmjobs.asp

Major Fields of Study

- Educational, recreational, and counseling services
- Fine and applied arts
- Humanities and related fields
- Social sciences and related fields
- Commerce, management and business administration
- Agricultural, biological, nutritional, and food sciences
- Engineering and applied sciences
- Applied science technologies and trades
- Health professions and related technologies
- Mathematics, computer, and physical sciences
- No specialization

Education Assumptions

A number of assumptions are used to derive the results of this forecast. The assumptions used to generate the results in Appendix C are described below.

Enrolment and Graduation

- The number of people who attend or complete school is calculated as a share of the total number in that age or gender group. This proportion is based on historic shares.
- Enrolment is defined as being full load equivalent for parchment courses, as it is only those who take parchment level courses who will graduate and thus affect the level of educational attainment in society.
- The number of students likely to graduate each year is determined based on the time distribution of enrolment and data on program lengths.
- College and university enrolment rates are assumed to continue to rise in the future, while graduation rates are kept constant.
- The age and gender distributions for new university graduates are projected with the same age and gender distributions from the educational attainment data.
- To calculate the number of college and trades graduates, the ratio of college and trades graduates to the general population is used. This value is then adjusted to ensure that the ratio of university graduates to college and trades graduates remains constant.
- The overall ratio of university to college and trades graduates is applied to the different age groups to project the number of college and trades graduates within each age group.
- Overall drop out rates and mature student rates are used for the different major fields of study. Mature students are students who either did not obtain a high school diploma or did not have sufficient marks to gain entry into a post-secondary institution, but were then admitted years later.

Educational Attainment

- Those who obtain a university certificate have occupational outcomes more similar to college graduates than university degree graduates, and thus are included in the "college and trade" level.
- To calculate the number of people with university, college and trades, and high school education, a stock-flow approach[2] is used.

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[2] **Stock-Flow Approach:** A method in estimating the future population of people in a group of interest. To find the forecasted population, the population from the previous year is adjusted to add those expected to enter that group and subtract those that are expected to leave that group. **Example:**

Number of people with College/Trades training $_{t+1}$	=	Number of people with College/Trades training $_{t}$	plus	Recent graduates of College/Trades $_{t+1}$	minus	People leaving group due to death, retirement, etc. $_{t+1}$

- Those with less than a high school education are determined to be those not already accounted for in other educational attainment categories.
- Less than high school educational attainment is adjusted to reflect the estimated portion of mature students in post-secondary institutions that do not have a high school diploma. High school educational attainment is also adjusted to subtract recent graduates from university and college and trades.
- The overall enrolment rate for mature students is used for all age groups within the mature student category.
- To project educational attainment by major field of study, the historic relative enrolment rate is maintained over the projection period.
- The share of new graduates by major field of study and migration are constant over time.
- University transfer programs are included as university enrollment and university certificates are classified as college and technical.

Appendix C

Educational Attainment

Both Genders	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Less Than High School	786,827	791,275	791,542	792,530	793,546	794,980	798,832	803,944	809,594	816,581	825,751	
% of Total	30.0%	29.7%	29.3%	29.0%	28.7%	28.4%	28.2%	28.0%	27.9%	27.8%	27.8%	
Growth Rate (%)	1.15	0.57	0.03	0.12	0.13	0.18	0.48	0.64	0.70	0.86	1.12	0.54
High School	596,652	596,745	596,042	594,572	592,204	588,986	584,961	580,212	574,863	568,997	562,687	
% of Total	22.7%	22.4%	22.1%	21.7%	21.4%	21.0%	20.6%	20.2%	19.8%	19.4%	18.9%	
Growth Rate (%)	0.22	0.02	-0.12	-0.25	-0.40	-0.54	-0.68	-0.81	-0.92	-1.02	-1.11	-0.51
College and Trade	799,418	815,353	831,084	846,721	862,157	877,414	892,454	907,307	922,043	936,647	951,121	
% of Total	30.4%	30.6%	30.8%	31.0%	31.1%	31.3%	31.5%	31.8%	31.7%	31.9%	32.0%	
Growth Rate (%)	2.05	1.99	1.93	1.88	1.82	1.77	1.71	1.66	1.62	1.58	1.55	1.78
University Degree	442,791	462,551	482,242	501,873	521,415	540,837	560,084	579,166	598,115	616,919	635,583	
% of Total	16.9%	17.4%	17.9%	18.3%	18.8%	19.3%	19.7%	20.2%	20.6%	21.0%	21.4%	
Growth Rate (%)	4.57	4.46	4.26	4.07	3.89	3.72	3.56	3.41	3.27	3.14	3.03	3.76

Females	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Less Than High School	386,632	387,547	386,460	385,757	385,121	384,746	385,609	387,145	388,996	391,547	395,205	
% of Total	29.6%	29.2%	28.8%	28.4%	28.0%	27.6%	27.4%	27.1%	26.9%	26.8%	26.7%	
Growth Rate (%)	0.81	0.24	-0.28	-0.18	-0.16	-0.10	0.22	0.40	0.48	0.66	0.93	0.27
High School	303,446	300,374	296,922	293,054	288,700	283,893	278,662	273,054	267,137	260,955	254,548	
% of Total	23.2%	22.7%	22.1%	21.6%	21.0%	20.4%	19.8%	19.1%	18.5%	17.9%	17.2%	
Growth Rate (%)	-0.79	-1.01	-1.15	-1.30	-1.49	-1.67	-1.84	-2.01	-2.17	-2.31	-2.46	-1.65
College and Trade	392,868	403,145	413,324	423,460	433,495	443,441	453,278	463,020	472,704	482,321	491,870	
% of Total	30.1%	30.4%	30.8%	31.1%	31.5%	31.8%	32.2%	32.5%	32.7%	33.0%	33.3%	
Growth Rate (%)	2.70	2.62	2.53	2.45	2.37	2.29	2.22	2.15	2.09	2.03	1.98	2.31
University Degree	222,653	234,351	245,967	257,569	269,143	280,667	292,106	303,463	314,758	325,977	337,129	
% of Total	17.1%	17.7%	18.3%	18.9%	19.6%	20.2%	20.7%	21.3%	21.8%	22.3%	22.8%	
Growth Rate (%)	5.43	5.25	4.96	4.72	4.49	4.28	4.08	3.89	3.72	3.56	3.42	4.35

Males	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Less Than High School	400,195	403,728	405,082	406,773	408,425	410,234	413,223	416,799	420,597	425,034	430,546	
% of Total	30.3%	30.1%	29.8%	29.6%	29.3%	29.1%	29.0%	28.9%	28.8%	28.8%	28.8%	
Growth Rate (%)	1.48	0.88	0.34	0.42	0.41	0.44	0.73	0.87	0.91	1.05	1.30	0.80
High School	293,206	296,371	299,119	301,518	303,505	305,093	306,299	307,158	307,726	308,042	308,138	
% of Total	22.2%	22.1%	22.0%	21.9%	21.8%	21.6%	21.5%	21.3%	21.1%	20.8%	20.6%	
Growth Rate (%)	1.29	1.08	0.93	0.80	0.66	0.52	0.40	0.28	0.19	0.10	0.03	0.57
College and Trade	406,551	412,209	417,760	423,262	428,662	433,972	439,176	444,287	449,339	454,326	459,251	
% of Total	30.8%	30.8%	30.8%	30.8%	30.8%	30.8%	30.8%	30.8%	30.8%	30.7%	30.7%	
Growth Rate (%)	1.43	1.39	1.35	1.32	1.28	1.24	1.20	1.16	1.14	1.11	1.08	1.24
University Degree	220,138	228,200	236,274	244,304	252,271	260,170	267,979	275,703	283,359	290,942	298,455	
% of Total	16.7%	17.0%	17.4%	17.8%	18.1%	18.5%	18.8%	19.1%	19.4%	19.7%	19.9%	
Growth Rate (%)	3.71	3.66	3.54	3.40	3.26	3.13	3.00	2.88	2.78	2.68	2.58	3.15

Appendix C

Major Fields of Study: College and Trade

Both Genders	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Educational, recreational and counselling services	31,071	31,500	31,920	32,339	32,753	33,164	33,569	33,969	34,368	34,763	35,155	
% of Total	3.9%	3.9%	3.8%	3.8%	3.8%	3.8%	3.8%	3.7%	3.7%	3.7%	3.7%	
Growth Rate (%)	1.41	1.38	1.33	1.31	1.28	1.25	1.22	1.19	1.17	1.15	1.13	1.26
Fine and applied arts	50,396	50,850	51,295	51,741	52,180	52,612	53,036	53,454	53,868	54,279	54,686	
% of Total	6.3%	6.2%	6.2%	6.1%	6.1%	6.0%	5.9%	5.9%	5.8%	5.8%	5.7%	
Growth Rate (%)	0.91	0.90	0.88	0.87	0.85	0.83	0.81	0.79	0.78	0.76	0.75	0.83
Humanities and related fields	21,496	22,388	23,267	24,140	25,003	25,856	26,699	27,531	28,356	29,172	29,982	
% of Total	2.7%	2.7%	2.8%	2.9%	2.9%	2.9%	3.0%	3.0%	3.1%	3.1%	3.2%	
Growth Rate (%)	4.33	4.15	3.93	3.75	3.57	3.41	3.26	3.12	3.00	2.88	2.78	3.47
Social sciences and related fields	37,679	39,627	41,561	43,484	45,390	47,279	49,149	51,001	52,840	54,665	56,478	
% of Total	4.7%	4.9%	5.0%	5.1%	5.3%	5.4%	5.5%	5.6%	5.7%	5.8%	5.9%	
Growth Rate (%)	5.47	5.17	4.88	4.63	4.38	4.16	3.96	3.77	3.61	3.45	3.32	4.25
Commerce, management and business administration	194,828	198,706	202,519	206,305	210,037	213,720	217,350	220,932	224,484	228,004	231,496	
% of Total	24.4%	24.4%	24.4%	24.4%	24.4%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	
Growth Rate (%)	2.05	1.99	1.92	1.87	1.81	1.75	1.70	1.65	1.61	1.57	1.53	1.77
Agricultural, biological, nutritional, and food sciences	40,941	41,887	42,824	43,759	44,685	45,602	46,508	47,406	48,298	49,184	50,064	
% of Total	5.1%	5.1%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.3%	
Growth Rate (%)	2.37	2.31	2.24	2.18	2.11	2.05	1.99	1.93	1.88	1.83	1.79	2.06
Engineering and applied sciences	2,808	2,872	2,935	2,996	3,056	3,114	3,171	3,226	3,279	3,332	3,383	
% of Total	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	
Growth Rate (%)	2.43	2.30	2.18	2.09	1.99	1.90	1.82	1.73	1.66	1.60	1.53	1.93
Applied science technologies and trades	310,319	314,294	318,182	322,031	325,802	329,503	333,126	336,677	340,181	343,636	347,044	
% of Total	38.8%	38.5%	38.3%	38.0%	37.8%	37.5%	37.3%	37.1%	36.9%	36.7%	36.5%	
Growth Rate (%)	1.32	1.28	1.24	1.21	1.17	1.14	1.10	1.07	1.04	1.02	0.99	1.14
Health professions and related technologies	103,922	107,269	110,592	113,906	117,201	120,478	123,734	126,971	130,195	133,404	136,595	
% of Total	13.0%	13.2%	13.3%	13.4%	13.6%	13.7%	13.9%	14.0%	14.1%	14.2%	14.4%	
Growth Rate (%)	3.36	3.22	3.10	3.00	2.89	2.80	2.70	2.62	2.54	2.46	2.39	2.83
Mathematics, computer and physical sciences	4,740	4,777	4,812	4,845	4,876	4,905	4,933	4,959	4,984	5,007	5,030	
% of Total	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%	0.5%	
Growth Rate (%)	0.84	0.79	0.72	0.69	0.64	0.60	0.56	0.53	0.50	0.47	0.45	0.62
No specialization	1,285	1,330	1,374	1,418	1,461	1,504	1,546	1,587	1,628	1,669	1,709	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	3.64	3.49	3.33	3.19	3.05	2.92	2.79	2.68	2.59	2.50	2.41	2.96

Appendix C

Major Fields of Study: College and Trade (Cont.)

Females	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Educational, recreational and counselling services	26,053	26,436	26,813	27,189	27,561	27,929	28,294	28,654	29,013	29,369	29,723	
% of Total	6.6%	6.6%	6.5%	6.4%	6.4%	6.3%	6.2%	6.2%	6.1%	6.1%	6.0%	
Growth Rate (%)	1.51	1.47	1.42	1.40	1.37	1.34	1.30	1.27	1.25	1.23	1.20	1.34
Fine and applied arts	36,550	36,891	37,226	37,560	37,892	38,218	38,539	38,854	39,167	39,476	39,783	
% of Total	9.3%	9.2%	9.0%	8.9%	8.7%	8.6%	8.5%	8.4%	8.3%	8.2%	8.1%	
Growth Rate (%)	0.95	0.93	0.91	0.90	0.88	0.86	0.84	0.82	0.80	0.79	0.78	0.86
Humanities and related fields	12,080	12,642	13,196	13,747	14,292	14,833	15,367	15,896	16,421	16,941	17,458	
% of Total	3.1%	3.1%	3.2%	3.2%	3.3%	3.3%	3.4%	3.4%	3.5%	3.5%	3.5%	
Growth Rate (%)	4.87	4.65	4.38	4.18	3.97	3.78	3.60	3.44	3.30	3.17	3.05	3.85
Social sciences and related fields	24,243	25,796	27,340	28,878	30,404	31,919	33,421	34,910	36,391	37,862	39,324	
% of Total	6.2%	6.4%	6.6%	6.8%	7.0%	7.2%	7.4%	7.5%	7.7%	7.8%	8.0%	
Growth Rate (%)	6.85	6.41	5.99	5.63	5.28	4.98	4.70	4.46	4.24	4.04	3.86	5.13
Commerce, management and business administration	148,076	150,863	153,606	156,332	159,022	161,679	164,301	166,890	169,460	172,010	174,541	
% of Total	37.7%	37.4%	37.2%	36.9%	36.7%	36.5%	36.2%	36.0%	35.8%	35.7%	35.5%	
Growth Rate (%)	1.93	1.88	1.82	1.77	1.72	1.67	1.62	1.58	1.54	1.50	1.47	1.68
Agricultural, biological, nutritional, and food sciences	18,039	18,614	19,185	19,753	20,316	20,875	21,427	21,975	22,519	23,060	23,598	
% of Total	4.6%	4.6%	4.6%	4.7%	4.7%	4.7%	4.7%	4.7%	4.8%	4.8%	4.8%	
Growth Rate (%)	3.29	3.19	3.06	2.96	2.85	2.75	2.65	2.56	2.48	2.40	2.33	2.77
Engineering and applied sciences	599	616	632	648	663	678	693	708	722	736	750	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	2.92	2.77	2.63	2.52	2.40	2.29	2.19	2.10	2.01	1.93	1.85	2.33
Applied science technologies and trades	34,024	35,199	36,366	37,527	38,675	39,812	40,935	42,047	43,149	44,242	45,326	
% of Total	8.7%	8.7%	8.8%	8.9%	8.9%	9.0%	9.0%	9.1%	9.1%	9.2%	9.2%	
Growth Rate (%)	3.60	3.46	3.31	3.19	3.06	2.94	2.82	2.71	2.62	2.53	2.45	2.97
Health professions and related technologies	89,964	92,806	95,627	98,441	101,238	104,021	106,787	109,538	112,278	115,007	117,722	
% of Total	22.9%	23.0%	23.1%	23.2%	23.4%	23.5%	23.6%	23.7%	23.8%	23.8%	23.9%	
Growth Rate (%)	3.29	3.16	3.04	2.94	2.84	2.75	2.66	2.58	2.50	2.43	2.36	2.78
Mathematics, computer and physical sciences	2,556	2,575	2,593	2,611	2,627	2,643	2,657	2,671	2,685	2,698	2,710	
% of Total	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
Growth Rate (%)	0.81	0.76	0.70	0.67	0.63	0.59	0.56	0.53	0.50	0.48	0.45	0.61
No specialization	681	708	735	762	788	814	840	865	891	916	940	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	4.19	4.00	3.81	3.64	3.47	3.31	3.16	3.03	2.91	2.80	2.71	3.37

Appendix C

Major Fields of Study: College and Trade (Cont.)

Males	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Educational, recreational and counselling services	5,019	5,063	5,107	5,150	5,192	5,234	5,275	5,315	5,355	5,394	5,433	
% of Total	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	
Growth Rate (%)	0.92	0.89	0.86	0.85	0.82	0.80	0.78	0.76	0.75	0.73	0.71	0.81
Fine and applied arts	13,847	13,959	14,069	14,179	14,287	14,393	14,498	14,600	14,702	14,802	14,902	
% of Total	3.4%	3.4%	3.4%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.2%	
Growth Rate (%)	0.82	0.81	0.79	0.78	0.76	0.74	0.72	0.71	0.70	0.69	0.68	0.75
Humanities and related fields	9,416	9,747	10,071	10,393	10,711	11,024	11,332	11,635	11,935	12,231	12,524	
% of Total	2.3%	2.4%	2.4%	2.5%	2.5%	2.5%	2.6%	2.6%	2.7%	2.7%	2.7%	
Growth Rate (%)	3.65	3.51	3.33	3.20	3.05	2.92	2.79	2.68	2.58	2.48	2.40	2.96
Social sciences and related fields	13,436	13,831	14,221	14,606	14,986	15,360	15,728	16,091	16,449	16,804	17,154	
% of Total	3.3%	3.4%	3.4%	3.4%	3.5%	3.5%	3.6%	3.6%	3.7%	3.7%	3.7%	
Growth Rate (%)	3.06	2.94	2.81	2.71	2.60	2.50	2.40	2.31	2.23	2.15	2.08	2.53
Commerce, management and business administration	46,752	47,843	48,913	49,973	51,015	52,041	53,049	54,042	55,024	55,994	56,954	
% of Total	11.5%	11.6%	11.7%	11.8%	11.9%	12.0%	12.1%	12.2%	12.2%	12.3%	12.4%	
Growth Rate (%)	2.41	2.33	2.24	2.17	2.09	2.01	1.94	1.87	1.82	1.76	1.71	2.03
Agricultural, biological, nutritional, and food sciences	22,901	23,272	23,640	24,006	24,369	24,727	25,081	25,431	25,779	26,124	26,466	
% of Total	5.6%	5.6%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.8%	
Growth Rate (%)	1.65	1.62	1.58	1.55	1.51	1.47	1.43	1.40	1.37	1.34	1.31	1.47
Engineering and applied sciences	2,209	2,257	2,303	2,349	2,393	2,436	2,477	2,518	2,557	2,596	2,633	
% of Total	0.5%	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
Growth Rate (%)	2.29	2.18	2.06	1.97	1.88	1.79	1.71	1.63	1.57	1.50	1.44	1.82
Applied science technologies and trades	276,296	279,095	281,815	284,504	287,127	289,691	292,190	294,630	297,032	299,394	301,718	
% of Total	67.9%	67.7%	67.4%	67.2%	66.9%	66.7%	66.5%	66.3%	66.0%	65.8%	65.6%	
Growth Rate (%)	1.04	1.01	0.97	0.95	0.92	0.89	0.86	0.84	0.82	0.80	0.78	0.90
Health professions and related technologies	13,957	14,463	14,965	15,466	15,963	16,457	16,947	17,434	17,917	18,397	18,873	
% of Total	3.4%	3.5%	3.6%	3.7%	3.7%	3.8%	3.9%	3.9%	4.0%	4.0%	4.1%	
Growth Rate (%)	3.79	3.62	3.47	3.35	3.22	3.10	2.98	2.87	2.77	2.68	2.59	3.13
Mathematics, computer and physical sciences	2,184	2,202	2,219	2,234	2,249	2,263	2,275	2,287	2,299	2,310	2,320	
% of Total	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	
Growth Rate (%)	0.88	0.82	0.75	0.71	0.65	0.61	0.57	0.53	0.50	0.47	0.44	0.63
No specialization	604	622	639	656	673	689	706	722	738	753	769	
% of Total	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	3.02	2.90	2.78	2.67	2.56	2.46	2.36	2.27	2.20	2.13	2.06	2.49

Appendix C

Major Fields of Study: University

Both Genders	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Educational, recreational and counselling services	90,133	93,122	96,158	99,212	102,263	105,307	108,335	111,347	114,349	117,339	120,319	
% of Total	20.4%	20.2%	20.0%	19.8%	19.7%	19.5%	19.4%	19.3%	19.2%	19.1%	19.0%	
Growth Rate (%)	3.51	3.32	3.26	3.18	3.08	2.98	2.88	2.78	2.70	2.61	2.54	2.98
Fine and applied arts	11,020	11,695	12,374	13,060	13,747	14,435	15,122	15,808	16,493	17,176	17,859	
% of Total	2.5%	2.5%	2.6%	2.6%	2.6%	2.7%	2.7%	2.7%	2.8%	2.8%	2.8%	
Growth Rate (%)	6.79	6.13	5.81	5.54	5.26	5.01	4.76	4.53	4.33	4.14	3.97	5.12
Humanities and related fields	34,906	36,301	37,679	39,053	40,419	41,773	43,114	44,441	45,756	47,060	48,353	
% of Total	7.9%	7.9%	7.8%	7.8%	7.8%	7.7%	7.7%	7.7%	7.7%	7.7%	7.8%	
Growth Rate (%)	4.05	4.00	3.80	3.65	3.50	3.35	3.21	3.08	2.96	2.85	2.75	3.38
Social sciences and related fields	68,042	71,446	74,920	78,413	81,898	85,369	88,816	92,239	95,643	99,027	102,391	
% of Total	15.4%	15.5%	15.6%	15.7%	15.8%	15.8%	15.9%	16.0%	16.1%	16.1%	16.2%	
Growth Rate (%)	5.15	5.00	4.86	4.66	4.45	4.24	4.04	3.85	3.69	3.54	3.40	4.26
Commerce, management and business administration	71,152	74,695	78,200	81,644	85,080	88,506	91,911	95,295	98,663	102,012	105,343	
% of Total	16.1%	16.2%	16.3%	16.3%	16.4%	16.4%	16.5%	16.5%	16.6%	16.6%	16.6%	
Growth Rate (%)	4.73	4.98	4.69	4.40	4.21	4.03	3.85	3.68	3.53	3.39	3.27	4.07
Agricultural, biological, nutritional, and food sciences	22,784	23,632	24,486	25,343	26,197	27,046	27,886	28,717	29,542	30,360	31,172	
% of Total	5.2%	5.1%	5.1%	5.1%	5.0%	5.0%	5.0%	5.0%	5.0%	4.9%	4.9%	
Growth Rate (%)	3.85	3.72	3.61	3.50	3.37	3.24	3.11	2.98	2.87	2.77	2.67	3.25
Engineering and applied sciences	57,598	60,532	63,442	66,334	69,194	72,018	74,803	77,549	80,260	82,938	85,583	
% of Total	13.0%	13.1%	13.2%	13.3%	13.3%	13.4%	13.4%	13.4%	13.5%	13.5%	13.5%	
Growth Rate (%)	5.40	5.09	4.81	4.56	4.31	4.08	3.87	3.67	3.50	3.34	3.19	4.17
Applied science technologies and trades	942	953	963	973	983	992	1,001	1,009	1,018	1,026	1,033	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	1.20	1.14	1.07	1.03	0.98	0.94	0.89	0.85	0.82	0.79	0.76	0.95
Health professions and related technologies	47,042	49,021	50,925	52,831	54,728	56,616	58,489	60,349	62,199	64,038	65,867	
% of Total	10.6%	10.6%	10.6%	10.6%	10.5%	10.5%	10.5%	10.5%	10.4%	10.4%	10.4%	
Growth Rate (%)	4.38	4.21	3.89	3.74	3.59	3.45	3.31	3.18	3.07	2.96	2.86	3.51
Mathematics, computer and physical sciences	37,317	39,067	40,759	42,436	44,098	45,742	47,366	48,970	50,556	52,125	53,677	
% of Total	8.4%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	
Growth Rate (%)	4.69	4.69	4.33	4.12	3.92	3.73	3.55	3.39	3.24	3.10	2.98	3.79
No specialization	999	1,037	1,085	1,134	1,183	1,232	1,280	1,329	1,378	1,426	1,474	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	5.32	3.78	4.65	4.51	4.32	4.14	3.96	3.80	3.66	3.52	3.39	4.09

Appendix C

Major Fields of Study: University (Cont.)

Females	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Educational, recreational and counselling services	61,291	63,521	65,770	68,031	70,291	72,544	74,785	77,014	79,236	81,447	83,650	
% of Total	27.6%	27.2%	26.8%	26.5%	26.2%	26.0%	25.7%	25.5%	25.3%	25.1%	24.9%	
Growth Rate (%)	3.86	3.64	3.54	3.44	3.32	3.21	3.09	2.98	2.88	2.79	2.70	3.22
Fine and applied arts	7,376	7,835	8,295	8,758	9,221	9,683	10,142	10,598	11,051	11,502	11,951	
% of Total	3.3%	3.4%	3.4%	3.4%	3.4%	3.5%	3.5%	3.5%	3.5%	3.5%	3.6%	
Growth Rate (%)	6.81	6.22	5.87	5.58	5.29	5.01	4.74	4.50	4.28	4.08	3.90	5.12
Humanities and related fields	19,999	20,980	21,954	22,928	23,896	24,858	25,810	26,754	27,690	28,619	29,540	
% of Total	9.0%	9.0%	9.0%	8.9%	8.9%	8.9%	8.9%	8.9%	8.8%	8.8%	8.8%	
Growth Rate (%)	5.06	4.91	4.64	4.43	4.22	4.02	3.83	3.66	3.50	3.35	3.22	4.08
Social sciences and related fields	36,799	39,046	41,337	43,645	45,954	48,257	50,548	52,827	55,096	57,353	59,601	
% of Total	16.6%	16.7%	16.9%	17.0%	17.1%	17.3%	17.4%	17.5%	17.6%	17.7%	17.8%	
Growth Rate (%)	6.36	6.11	5.87	5.58	5.29	5.01	4.75	4.51	4.29	4.10	3.92	5.07
Commerce, management and business administration	29,880	31,749	33,585	35,382	37,181	38,976	40,764	42,543	44,316	46,080	47,836	
% of Total	13.5%	13.6%	13.7%	13.8%	13.9%	13.9%	14.0%	14.1%	14.1%	14.2%	14.3%	
Growth Rate (%)	5.94	6.25	5.78	5.35	5.08	4.83	4.59	4.36	4.17	3.98	3.81	4.92
Agricultural, biological, nutritional, and food sciences	11,871	12,463	13,053	13,645	14,236	14,824	15,407	15,985	16,558	17,127	17,693	
% of Total	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	
Growth Rate (%)	5.19	4.98	4.73	4.54	4.33	4.13	3.93	3.75	3.59	3.44	3.30	4.17
Engineering and applied sciences	9,538	10,404	11,264	12,122	12,975	13,822	14,661	15,493	16,317	17,134	17,944	
% of Total	4.3%	4.5%	4.6%	4.7%	4.8%	4.9%	5.0%	5.1%	5.2%	5.3%	5.3%	
Growth Rate (%)	10.11	9.08	8.26	7.62	7.04	6.53	6.07	5.67	5.32	5.01	4.73	6.86
Applied science technologies and trades	282	288	295	302	308	314	320	326	332	338	343	
% of Total	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	
Growth Rate (%)	2.56	2.44	2.31	2.22	2.11	2.02	1.93	1.85	1.78	1.71	1.65	2.05
Health professions and related technologies	33,360	34,993	36,551	38,108	39,659	41,202	42,732	44,252	45,763	47,264	48,757	
% of Total	15.0%	15.0%	14.9%	14.8%	14.8%	14.7%	14.7%	14.6%	14.6%	14.6%	14.5%	
Growth Rate (%)	5.12	4.90	4.45	4.26	4.07	3.89	3.71	3.56	3.41	3.28	3.16	3.98
Mathematics, computer and physical sciences	11,106	11,779	12,427	13,071	13,711	14,344	14,971	15,591	16,205	16,814	17,416	
% of Total	5.0%	5.0%	5.1%	5.1%	5.1%	5.1%	5.1%	5.2%	5.2%	5.2%	5.2%	
Growth Rate (%)	6.12	6.06	5.50	5.18	4.89	4.62	4.37	4.14	3.94	3.75	3.58	4.74
No specialization	575	599	627	655	684	712	741	769	798	826	854	
% of Total	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	
Growth Rate (%)	5.42	4.07	4.72	4.55	4.36	4.18	4.00	3.84	3.69	3.55	3.41	4.16

Appendix C

Major Fields of Study: University (Cont.)

Males	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average, 2005-2015
Educational, recreational and counselling services	28,842	29,602	30,388	31,181	31,973	32,763	33,550	34,333	35,114	35,892	36,668	
% of Total	13.1%	13.0%	12.9%	12.8%	12.7%	12.6%	12.6%	12.5%	12.4%	12.4%	12.3%	
Growth Rate (%)	2.76	2.63	2.66	2.61	2.54	2.47	2.40	2.33	2.27	2.22	2.16	2.46
Fine and applied arts	3,644	3,860	4,079	4,301	4,526	4,752	4,980	5,210	5,441	5,674	5,908	
% of Total	1.7%	1.7%	1.7%	1.8%	1.8%	1.8%	1.9%	1.9%	1.9%	2.0%	2.0%	
Growth Rate (%)	6.75	5.93	5.68	5.44	5.22	5.00	4.80	4.61	4.44	4.27	4.12	5.12
Humanities and related fields	14,907	15,321	15,725	16,126	16,523	16,916	17,304	17,687	18,066	18,441	18,813	
% of Total	6.8%	6.7%	6.7%	6.6%	6.6%	6.5%	6.5%	6.4%	6.4%	6.4%	6.3%	
Growth Rate (%)	2.73	2.78	2.64	2.55	2.46	2.38	2.29	2.21	2.14	2.08	2.01	2.39
Social sciences and related fields	31,243	32,400	33,583	34,767	35,944	37,112	38,268	39,413	40,548	41,673	42,789	
% of Total	14.2%	14.2%	14.2%	14.3%	14.3%	14.3%	14.3%	14.3%	14.4%	14.4%	14.4%	
Growth Rate (%)	3.75	3.71	3.65	3.53	3.39	3.25	3.12	2.99	2.88	2.78	2.68	3.25
Commerce, management and business administration	41,272	42,946	44,615	46,261	47,900	49,530	51,147	52,752	54,348	55,933	57,507	
% of Total	18.8%	18.8%	18.9%	19.0%	19.0%	19.1%	19.1%	19.2%	19.2%	19.3%	19.3%	
Growth Rate (%)	3.87	4.06	3.89	3.69	3.54	3.40	3.27	3.14	3.02	2.92	2.82	3.42
Agricultural, biological, nutritional, and food sciences	10,913	11,169	11,433	11,698	11,961	12,221	12,479	12,733	12,984	13,233	13,480	
% of Total	5.0%	4.9%	4.8%	4.8%	4.8%	4.7%	4.7%	4.6%	4.6%	4.6%	4.5%	
Growth Rate (%)	2.44	2.35	2.36	2.32	2.25	2.18	2.10	2.04	1.98	1.92	1.86	2.16
Engineering and applied sciences	48,060	50,128	52,178	54,212	56,218	58,196	60,142	62,056	63,944	65,804	67,639	
% of Total	21.9%	22.0%	22.1%	22.2%	22.3%	22.4%	22.5%	22.6%	22.6%	22.7%	22.7%	
Growth Rate (%)	4.52	4.30	4.09	3.90	3.70	3.52	3.34	3.18	3.04	2.91	2.79	3.57
Applied science technologies and trades	661	665	668	672	675	678	681	683	686	688	690	
% of Total	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	0.63	0.59	0.54	0.51	0.48	0.44	0.41	0.38	0.36	0.34	0.32	0.45
Health professions and related technologies	13,682	14,027	14,375	14,723	15,069	15,414	15,756	16,097	16,436	16,774	17,110	
% of Total	6.2%	6.2%	6.1%	6.0%	6.0%	5.9%	5.9%	5.9%	5.8%	5.8%	5.8%	
Growth Rate (%)	2.62	2.53	2.48	2.42	2.35	2.29	2.22	2.16	2.11	2.05	2.00	2.29
Mathematics, computer and physical sciences	26,211	27,287	28,331	29,365	30,387	31,398	32,395	33,379	34,351	35,311	36,261	
% of Total	11.9%	12.0%	12.0%	12.0%	12.1%	12.1%	12.1%	12.1%	12.2%	12.2%	12.2%	
Growth Rate (%)	4.10	4.10	3.83	3.65	3.48	3.33	3.18	3.04	2.91	2.80	2.69	3.37
No specialization	424	438	458	478	499	519	539	560	580	600	620	
% of Total	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Growth Rate (%)	5.19	3.39	4.54	4.45	4.26	4.08	3.91	3.75	3.61	3.48	3.35	4.00